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REPORT ON THE DENTAL HEALTH PROBLEM

IN

FOUR SELECTED COMMUNITIES IN CLATSOP COUNTY

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Prepared by Oregon State Board of Health  
Dental Health Section - 1955

## FOREWORD

This report is a brief resume' of the status of the dental health of those children examined in regards to dental caries (tooth decay). Other dental problems such as gum disturbances, and malocclusion are of concern as to frequency of occurrence and to unmet needs. The extent of these problems should be determined by other studies.

The purpose of a dental survey is to ascertain a community's dental health problem as in like manner a dentist or physician examines his patients and makes a diagnosis prior to extensive treatment or surgery. The planning of a dental survey normally takes into consideration the type of data being sought; the areas to be covered to satisfy the survey requirements; the availability of dental personnel and time required to conduct the survey.

The first survey being reported in this report was conducted in Gearhart in 1952 by Dr. Rex T. Baldwin (a Gearhart Dentist). In January, 1954 a study was initiated in Astoria and later extended to Gearhart, Seaside and Warrenton.

The coordination of the program and the survey schedule was arranged by the Clatsop County Health Department. Members of the Clatsop County Dental Society and those parents, who acted as recorders, participated in the surveys in addition to the Dental Health Section of the Oregon State Board of Health.

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REPORT ON THE DENTAL HEALTH PROGRAM IN FOUR SELECTED COMMUNITIES IN CLATSOP COUNTY--. Some communities are more "dental-minded" than others. This may be dependent upon the educational program that is present within the community conducted by the schools, the health department and the dental profession. Some communities do not have the gross neglect as noted in unmet dental care needs, as early dental care is being sought and obtained.

Due to lack of dentists within the community who will accept children as patients as well as the indifference of parents as to need of early care for the child presents another dental problem. Due to finances and the problem of travel, a certain segment of the community will always be handicapped. No effort has been made to determine community differences of possible socio-economic factors as it relates to the dental problem.

When the prevalence of the dental disease is high and occurs more rapidly than the dental profession can take care of it, preventive measures should be adopted wherever applicable. A review of the dental manpower, the prevalence of dental caries, and the effects of the preventive measure, fluoridation, is being reported as it applies to the children of Clatsop County.

DENTAL MANPOWER IN CLATSOP COUNTY--. In Clatsop County, 1954-1955, there were twenty-two dentists that served a population of 30,776; 15 in Astoria, 1 in Gearhart, 5 in Seaside and 1 in Warrenton. The ratio of dentists per population is 1 to 1,399. One dentist per 1,200 population is considered a very good ratio. However, in Astoria the ratio of dentists per population is 1 to 822 persons. Gearhart has 1 dentist to 568 population, Seaside 1 to 777, and Warrenton 1 to 1,896. Population-wise, there are twice the number of persons per dentist in Warrenton than in Seaside or Astoria and three times as many in Warrenton compared to Gearhart. The state ratio is 1 to 1,460 and for the United States 1 to 1,669.

Of the total population of the county, 60.7 per-cent of the people live in these four communities. The 1954-55 Oregon School Directory shows about 67 per-cent of the children lived in these four communities. This leaves about 33 per-cent of the children in the remaining part of the county who have to seek dental care from one of these four communities. It is well to keep in mind the ratio of dental manpower and the availability of dental care when comparing amount of care being provided in each community.

The amount of dental care being provided Astoria children is in greater proportion than that noted in most of the areas of the state. This may be attributed to the fact that the public may be more dental conscious and aware of their high tooth decay rate. There remains a great need for more dental services available for all Clatsop County children. In Table No. 3 an example is shown of the amount of care being provided in the filled teeth ("F" and "f") for the average six and twelve-year-old. The unmet needs are to be noted in the decayed ("D" and "d") which need attention. Though the Clatsop County dental manpower ratio is considered above the state average, these unmet needs may be dependent upon other factors such as: lack of awareness of the parents that their child



needs to go the dentist more frequently; economic factors; or need for more dentists to care for children.

DENTAL SURVEY--. A questionnaire was sent home with each child of the first, third, fifth and seventh grades as well as to those children ages 14, 15 and 16 years. In Gearhart all of the elementary grades were included due to the small number of children available. The eligibility of those children included in the survey was established by a questionnaire which was sent to the parents. Only those children were examined as so indicated by the parent that they wished their child to participate in the program. The frequency in which children see their dentist, future appointments and residence was obtained through the questionnaire.

Normally, we find even age groups in the odd numbered grades. There were sufficient number of children having odd ages within these grades so that it was not necessary to interpolate for these age groups. The data collected fell into the normal expectancy for all age groups except where there was insufficient number of children to provide a representative sample.

The dental surveys were conducted in rooms made available in each of the schools. Portable dental equipment was used which included artificial lighting. The type of examination followed falls under the classification of the mouth mirror and explorer dental inspection.

A numerical determination of the decayed, missing and filled teeth for each child examined was established. The local dentists assisted the Dental Director in the Astoria Study. Members of the PTA and Room Mothers assisted as recorders. The 1954-55 studies of Gearhart, Warrenton and Seaside were conducted by the Dental Director. Dr. Rex T. Baldwin, Gearhart, Oregon, conducted the 1952 Gearhart Survey under the supervision of the Oregon State Board of Health.

The data collected is normally separated into age groups for continuous and non-continuous resident children. The data collected on continuous residence children is normally used when evaluating programs. However, this report is being given for all children in order to illustrate the extent of the dental care problem.

The first grade children of one Astoria Elementary School were examined in 1955 in order to determine what benefits were being derived from fluoridation during the short period of time this program has been in operation as compared to the 1954 survey findings.

From the questionnaires, an attempt was made to find out when the children had last seen a dentist. In Table 1 differences are to be noted that do occur in dental appointments for six-year-old children.

In every community of the state where dental surveys have been conducted, conditions other than that of tooth decay have been found which indicated immediate need for a more complete follow-up by a dentist and sometimes a physician. The importance of periodic examination by a dentist cannot be over-emphasized.

TABLE No. 1

| City             | Percentage of Children with Dental Appointments or<br>Period of Time Since Last Visit to Dentist |                    |                   |                    |                       |
|------------------|--------------------------------------------------------------------------------------------------|--------------------|-------------------|--------------------|-----------------------|
|                  | Never<br>Been                                                                                    | Within<br>Last yr. | Year or<br>Longer | Future<br>Appoint. | No Statement<br>Given |
| Astoria (1954)   | 14                                                                                               | 67                 | 11                | 20                 | 8                     |
| Gearhart (1955)  | 33                                                                                               | 53                 | 13                | 7                  | 1                     |
| Seaside (1955)   | 19                                                                                               | 67                 | 5                 | 10                 | 9                     |
| Warrenton (1955) | 32                                                                                               | 33                 | 35                | 12                 | 0                     |
| State Average*   | 20                                                                                               | 64                 | 12                | 19                 | 3                     |

\*Eleven Communities Surveyed.

DENTAL CARIES--. Dental caries (tooth-decay) is considered the most prevalent disease of modern man, outside of the common cold. The data compiled at the time of World War II, showed that the inductees from the State of Oregon were surpassed by only four other states in having the highest tooth decay rate. Studies conducted in 1947-48 by Hadjimarkos and Storvick showed that the children 14, 15 and 16 years of age in Clatsop County had the highest dental caries rate of any of the four areas under consideration at that time. In more recent studies, there is noted only slight differences in the dental caries attack rate of the various age grouping of Oregon children living in communities having fluoride-deficient water supplies, see Table 2 and Figure 1. This holds particularly true for the primary and permanent dentitions up to and through the age of 13 year old children.

When considering the number of children available in studies of small communities, the results must be considered as a trend. These trends show existing conditions as noted in each individual community.

Dental caries rates are expressed as the number of "DMF" and "def" teeth per 100 children. The data as presented here will be considered as per child. ("DMF" means decayed (D), missing (M), and filled (F) permanent teeth and "def" as decayed (d), indicated for extraction (e) and filled (f) primary (baby or deciduous teeth). The "d", "M", and "F" teeth when added together make up the "DMF" teeth. The same applies to the "def" teeth for primary dentition. The rates may be quite similar between communities but the "D", "M" and "F" categories of DMF teeth may vary, dependent upon the amount of dental care being sought and provided.

SURVEY FINDINGS--. When children enter school at the age of about six years, the condition found is somewhat appalling as to the need for dental care. It is to be remembered that only 33 to 67 percent of the children are receiving periodic care.



SIX YEAR OLD CHILDREN--. In 1954 a survey conducted in Astoria showed there were 5.5 def teeth of which about two teeth were filled; however, in 1955 of 4.7 def teeth there was an average of 2.7 filled teeth per child. The def rate is lower in Astoria and the filled tooth rate higher in the interval of one year's time.

In 1952 the Gearhart children had 4.9 def teeth of which 1.1 were filled and in 1955 they had 3.1 def teeth with an average of 0.6 teeth filled.

Seaside had 5.4 def teeth of which 1.6 are filled and Warrenton had 6.6 def teeth and only 1.2 are filled. Gearhart children in 1955 had half the def rate of Warrenton. In Astoria the permanent teeth which are noted by DMF rates, in 1954 showed 0.7 of which only 0.17 were filled, while in 1955 the DMF rate was 0.58 and the teeth being filled was 0.15.

Gearhart children in 1952 had 1.88 DMF teeth, which rate was reduced 0.33 DMF teeth by 1955. Seaside and Warrenton had 0.98 and 0.82 DMF teeth respectively. Gearhart in 1952 for the small number of children examined showed the highest average of DMF teeth for the six year olds and in 1955 their rate was the lowest.

By adding the number of DMF and def teeth of the Astoria six year olds, we find the rate has changed in one year from 6.22 to 5.28 affected teeth per child - a saving of about one tooth per child or a 15 per-cent reduction in rate of decay. In Gearhart, after a three year interval, we find a reduction from 6.76 to 3.40 or more than three teeth saved per child or a 49 per-cent reduction in rate of decay. The same age child in Seaside has experienced 6.4 and in Warrenton the total is 7.43, which is almost twice as much. The twelve year old children of Gearhart show very little difference in the years 1952 and 1955 except that fewer teeth are missing. There were a few more decayed teeth that could be restored, while the amount of fillings being placed remains approximately the same. The tooth decay problem in Astoria, Seaside and Warrenton are practically the same while Gearhart is slightly lower for the twelve year old group.

The dental care problem is slightly reduced, but the need for dental care in Gearhart is still an important factor in relation to the total dental problem. It is evident that the dentists in Gearhart and adjoining communities caring for Gearhart children are providing the same amount of care for all children in 1955 as in 1952. Of the total problem of "DMF" teeth for all children in Gearhart, 1952, Figure 3, noted in the pie-chart, 29.1 per-cent of the teeth were being filled while in 1955, of the total problem of "DMF" teeth, 51 per-cent of the teeth are filled. In other words, although the dentists are filling the same number of teeth, they are coming closer to meeting the total problem. The number of teeth indicated for extraction or have been extracted has been reduced from 9.7 per-cent to 5.4 per-cent. This difference noted in DMF rates in Gearhart Surveys of 1952 and 1955, is due to the introduction of a preventive program. After three and one-half years of fluoridation, there has been a reduction for all children of about 32 per-cent of the decayed, missing and filled rate (DMF) or a saving of one and one-half teeth per child, free of tooth decay.



Of the four communities, there are only slight differences in the incidence of tooth decay for the respective age groups up to 13 years of age, as illustrated in Figure 1. The differences noted for the 14, 15, 16 year olds can be attributed to the small number of continuous residence children available and the small number of children examined. The tooth decay rates prior to Astoria's, Gearhart's and Warrenton's fluoridation program, and Seaside provide a base-line data from which future evaluations can be made of dental programs of these communities.

There were 2,086 children seen in 1954 and 1955 in Clatsop County of which have 7,153 teeth that are decayed and in need of restoration; 1,434 teeth indicated for extractions or beyond restoration; 414 permanent teeth have been extracted and only 6,798 permanent and primary teeth have been filled.

FLUORIDATION--. Dental scientists in the 1930's found that there was a correlation between the incidence of tooth decay and the amount of fluoride present in water supplies. Those children who have always lived in areas with fluoride-bearing water supplies have about two-thirds less tooth decay than those children living in fluoride-deficient areas. Scientists could see no reason why equally low decay rates should not be obtained by adding the same tiny amount of fluoride to community water supplies as nature had put into hundreds of water supplies throughout the country.

Grand Rapids, Michigan has been fluoridating their water supply since 1945. The children in Grand Rapids, before fluorides were added to the water, had two-thirds more tooth decay than the children of Aurora, where the water contained natural fluorides. In 1954 Grand Rapids children 8 years of age and younger had the same low decay rates as children of the same age in Aurora. More than substantial reductions in tooth decay are to be noted in older children who were not expected to benefit from the program. Grand Rapids was the first community to start fluoridation, but others rapidly followed.

The decay rates of Grand Rapids, Michigan children, prior to fluoridation, are quite similar to that of Oregon children using fluoride-deficient water, compare Figures 1 and 2. Aurora, Illinois, which has a very low decay rate, has the optimum amounts of fluorides (1.2 PPM). After nine years of fluoridation, Grand Rapids, Michigan is beginning to approach the benefits as experienced in Aurora, Figure 2.

The trend that is being noted in Gearhart and Astoria children for the periods of fluoridating of their respective water supply follows the pattern of other communities fluoridating for the same period of time. (Figures 4, 5)

Fluoridation has proved effective, safe, and economical. Communities that have adopted this measure are providing their children with a known benefit of more caries-resistant teeth than they could otherwise ever have had. As of July 1, 1955, there were 1,073 communities serving 20,620,850 population fluoridating their water supplies.

Figures 4, 5, 6, 7 show the comparison of the DMF Rates of communities surveyed in Clatsop County with a natural fluoride community and in relation to the benefits received by Gearhart children. Warrenton



(1954-55), Gearhart (1952), Seaside (1955) and Astoria (1954) rates are quite similar; each of these communities has been compared to the 1955 dental finding of Gearhart.

The Warrenton and Gearhart water supplies originate from a common source. The water supply, as it enters the City of Gearhart, has been supplemented with fluoride, from 1951 to-date. It was pointed out in Figure 1, that Warrenton and Gearhart tooth decay rates were quite similar. Figure 5 shows where Gearhart is beginning to approach the tooth decay rate of a known water supply having the optimal amounts of fluoride (1.2 PPM F). Warrenton tooth decay rate in 1955 is practically identical, except for one age group, to that of Gearhart in 1952. It is quite evident that fluoridation is having an effect on the tooth decay experiences of this community. As previously pointed out, the amount of dental care being provided the children of Gearhart remains the same per child in 1955 as in 1952. However, the number of extractions and amount of tooth decay has declined in Gearhart as noted in Figure 3.

The incidence of tooth decay may be the same but the amount of dental care being provided will vary as to availability and desire for dental services. In Gearhart, the reverse holds true. The amount of care per child remains the same, but there is less tooth decay.

These preventive measures which have been proven effective should be considered in every community's plan for better dental health. These are recommended:

1. Fluoridation is the most economical and feasible measure that can be adopted by a community to curtail dental caries.
2. An adequate diet is important, and special emphasis should be given to restricting those confections which have high refined carbohydrates values.
3. Good oral hygiene has merit in preventing dental disorders.
4. Topical application of fluorides is recommended for the teeth of children who have not had the benefit of drinking fluoridated water all of their lives.
5. Encouragement of parents to seek early dental care for their children.



SUMMARY

1. Clatsop County ratio of dentists per population (1:1,399) is better than the national and state ratios.
2. There is a difference between the Clatsop County communities in seeking early dental care at various age group levels.
3. There is practically no difference between each community in respect to tooth decay rates prior to fluoridation.
4. Fluoridation program is being followed in Astoria and Gearhart and approved in Warrenton as a means to curtail tooth decay.
5. Gearhart and Warrenton use the same source of water. In the three and a half years since Gearhart added fluorides, the decay rates have dropped, while in Warrenton the rates are similar to Gearhart prior to fluoridation benefits.
6. There has been a 32 per-cent reduction in the DMF Rate in all Gearhart children where fluoridation has been carried on for three years.
7. Periodic evaluation of the fluoridation programs should be made in order to keep the public informed of the progress being made.
8. Studies should be conducted to evaluate other dental health problems.

D-M-F\* RATES

Children of Various Oregon Communities

Ages 6 - 16

| Age | Astoria | Bend  | Klamath Falls (City) | Klamath Falls (Rural) | McMinn. | Newport | Salem | Seapoose | Seaside | Springfield |
|-----|---------|-------|----------------------|-----------------------|---------|---------|-------|----------|---------|-------------|
| 6   | 0.72    | 0.38  | 0.61                 | 0.59                  | 1.23    | 0.66    | 0.64  | 0.77     | 0.98    | /           |
| 7   | 1.23    | 1.25  | 1.58                 | 1.51                  | 1.43    | 1.54    | 1.33  | 1.71     | 1.43    | 2.12        |
| 8   | 2.64    | 2.55  | 2.66                 | 2.55                  | 2.63    | 2.64    | 2.41  | 2.11     | 2.11    | 3.49        |
| 9   | 3.28    | 3.30  | 3.01                 | 3.15                  | 4.06    | 3.14    | 3.83  | 2.78     | 2.91    | 4.13        |
| 10  | 4.52    | 4.53  | 3.99                 | 3.98                  | 5.02    | 3.17    | 3.95  | 4.70     | 3.78    | 4.96        |
| 11  | 5.47    | 5.02  | 5.51                 | 4.69                  | 5.00    | 6.42    | 5.24  | 6.40     | 5.41    | 6.53        |
| 12  | 7.23    | 6.72  | 6.07                 | 4.65                  | 6.62    | 7.00    | 6.76  | 7.45     | 7.52    | 8.31        |
| 13  | 9.42    | 8.58  | 7.45                 | 7.81                  | 4.33    | 5.50    | 7.44  | 9.00     | 8.95    | 10.97       |
| 14  | 12.12   | 13.00 | /                    | 7.44                  | 9.96    | 11.07   | 14.50 | 11.72    | 10.85   | /           |
| 15  | 13.22   | 15.76 | /                    | 11.10                 | 8.00    | 10.91   | /     | 10.92    | 12.50   | /           |
| 16  | 15.00   | 14.80 | /                    | 12.00                 | 14.00   | 17.00   | /     | 11.36    | /       | /           |

\*Decayed, Missing and Filled Permanent Teeth

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TABLE NO. 2



Comparison of D-M-F and d-e-f Rates for Children 6 & 12 Years Old

In Four Communities in Clatsop County

| Community |      | Age | No. of Child. | Permanent Teeth |                |               |              |                |                     |               |              |
|-----------|------|-----|---------------|-----------------|----------------|---------------|--------------|----------------|---------------------|---------------|--------------|
|           |      |     |               | "D"<br>Decayed  | "M"<br>Missing | "F"<br>Filled | Total<br>DMF | "d"<br>decayed | "e"<br>ind.for ext. | "f"<br>filled | Total<br>def |
| Astoria   | 1954 | 6   | 183           | 0.54            | 0.01           | 0.17          | 0.72         | 2.72           | 0.79                | 1.99          | 5.50         |
| Astoria   | 1955 | 6   | 89            | 0.43            | 0.00           | 0.15          | 0.58         | 1.73           | 0.32                | 2.65          | 4.70         |
| Gearhart  | 1952 | 6   | 8             | 1.63            | 0.00           | 0.25          | 1.88         | 3.75           | 0.00                | 1.13          | 4.88         |
| Gearhart  | 1955 | 6   | 15            | 0.20            | 0.13           | 0.00          | 0.33         | 2.07           | 0.40                | 0.60          | 3.07         |
| Seaside   | 1955 | 6   | 59            | 0.92            | 0.00           | 0.06          | 0.98         | 3.14           | 0.72                | 1.56          | 5.42         |
| Warrenton | 1954 | 6   | 49            | 0.78            | 0.04           | 0.00          | 0.82         | 4.16           | 1.27                | 1.18          | 6.61         |
|           |      |     |               |                 |                |               |              |                |                     |               |              |
| Astoria   | 1954 | 12  | 80            | 2.78            | 0.40           | 4.05          | 7.23         | 0.15           | 0.08                | 0.32          | 0.55         |
| Gearhart  | 1952 | 12  | 4             | 1.75            | 0.75           | 4.00          | 6.50         | 0.50           | 0.00                | 0.25          | 0.75         |
| Gearhart  | 1955 | 12  | 16            | 2.19            | 0.37           | 3.75          | 6.31         | 0.13           | 0.05                | 0.13          | 0.31         |
| Seaside   | 1955 | 12  | 58            | 3.55            | 0.66           | 3.31          | 7.52         | 0.36           | 0.09                | 0.07          | 0.52         |
| Warrenton | 1954 | 12  | 34            | 3.18            | 0.61           | 3.27          | 7.06         | 0.38           | 0.06                | 0.21          | 0.65         |

TABLE NO. 3



# COMPARISON OF DECAYED, MISSING & FILLED TEETH\* PER CHILD CLATSOP COUNTY CHILDREN PRIOR TO FLUORIDATION

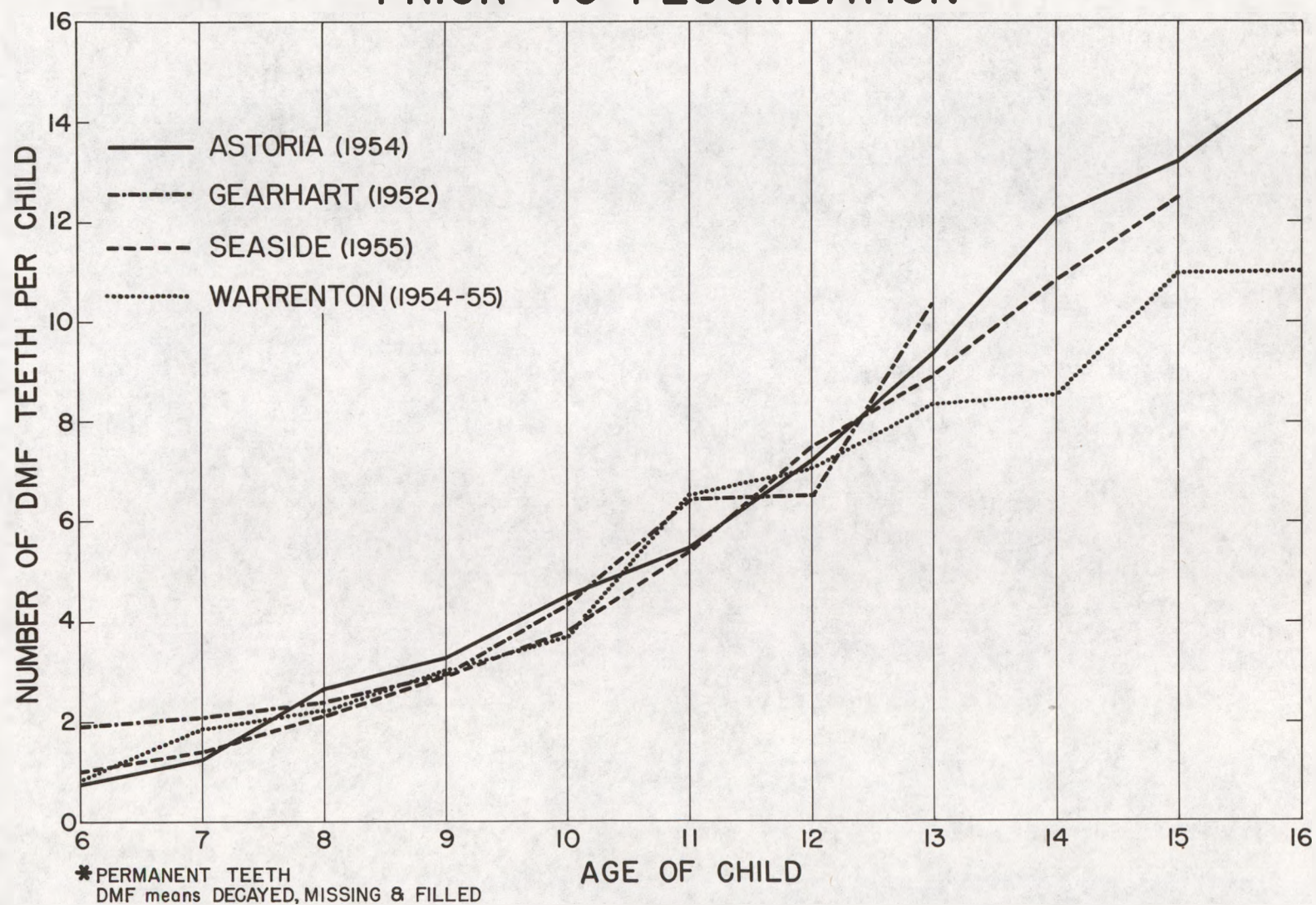
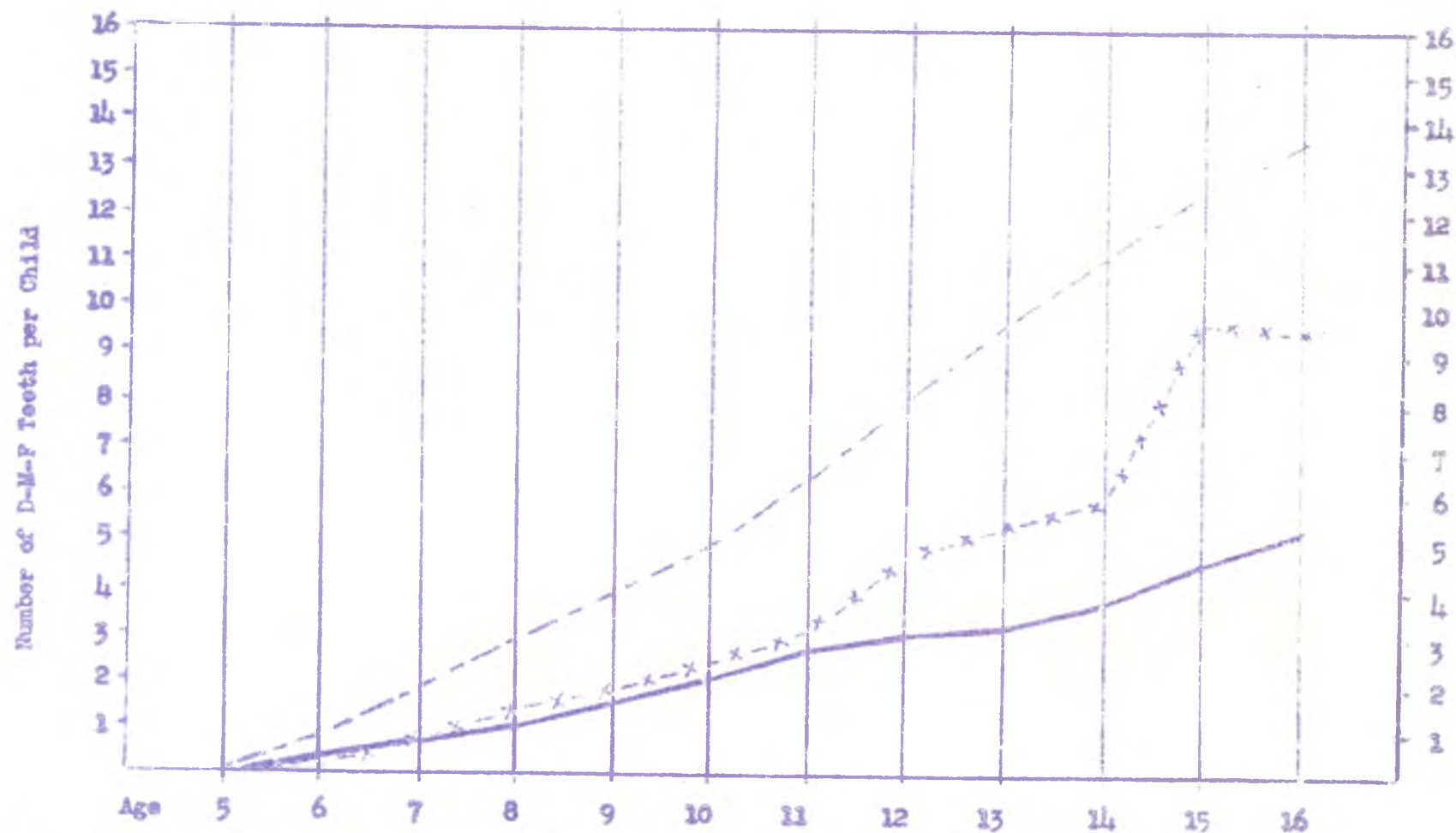


FIGURE 1



COMPARISON OF D-M-F\* TEETH  
of Aurora, Illinois and Grand Rapids, Michigan (before & after fluoridation)



\*Decayed, Missing & Filled Permanent Teeth

- Grand Rapids, 1945 (before fluoridation)
- - - - - Grand Rapids, 1953 (9 years after fluoridation)
- Aurora (natural fluoridation, 1.2 p.p.m.)

FIGURE 2

# DECAYED, MISSING AND FILLED TEETH GEARHART CHILDREN

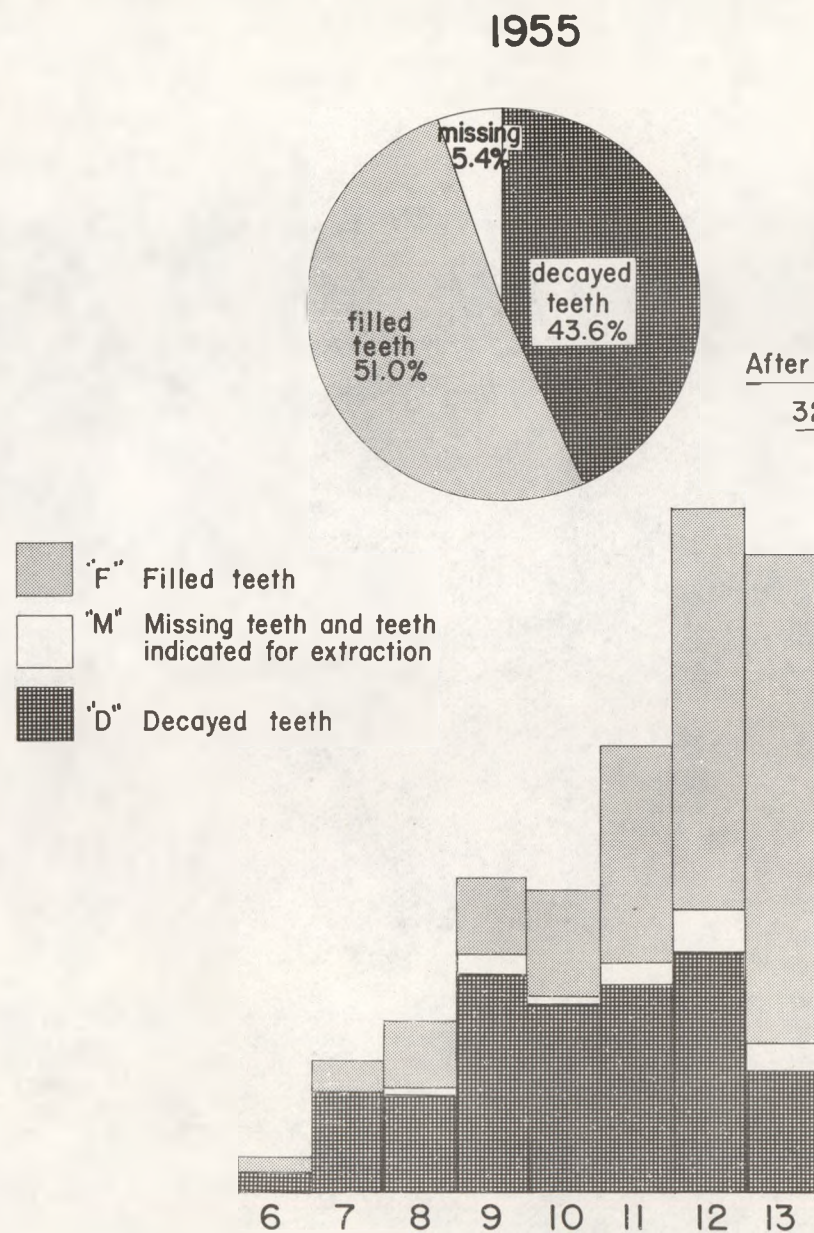
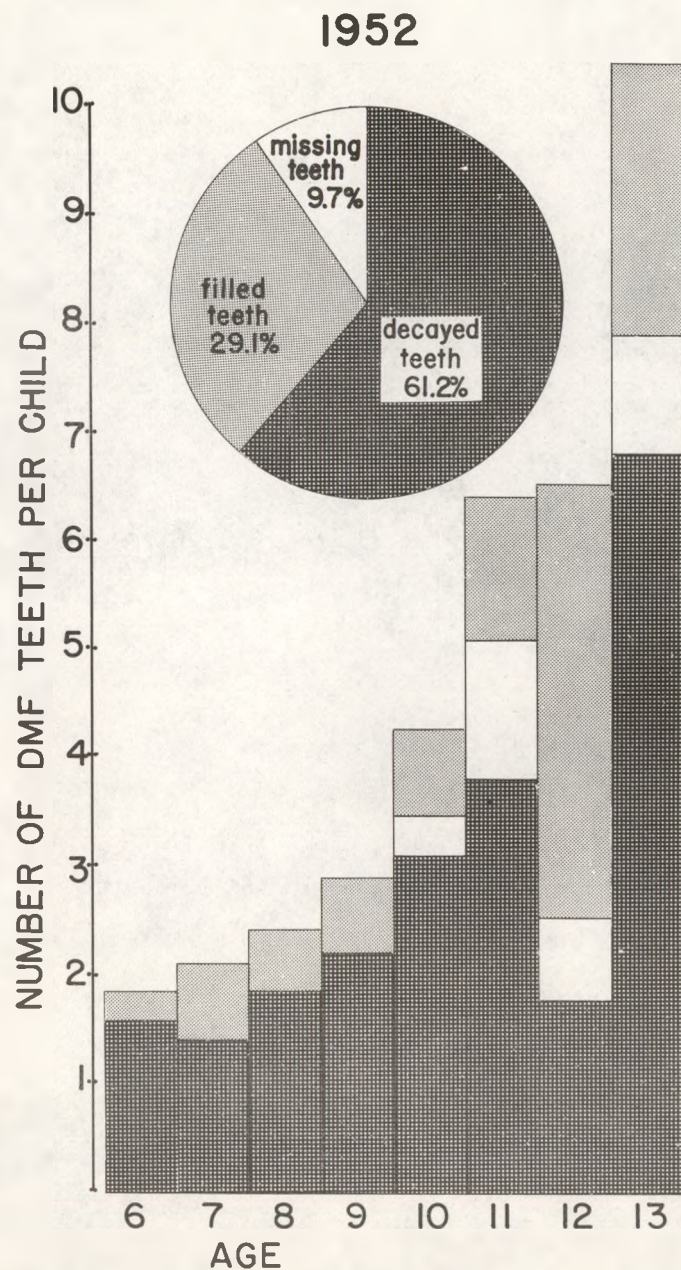
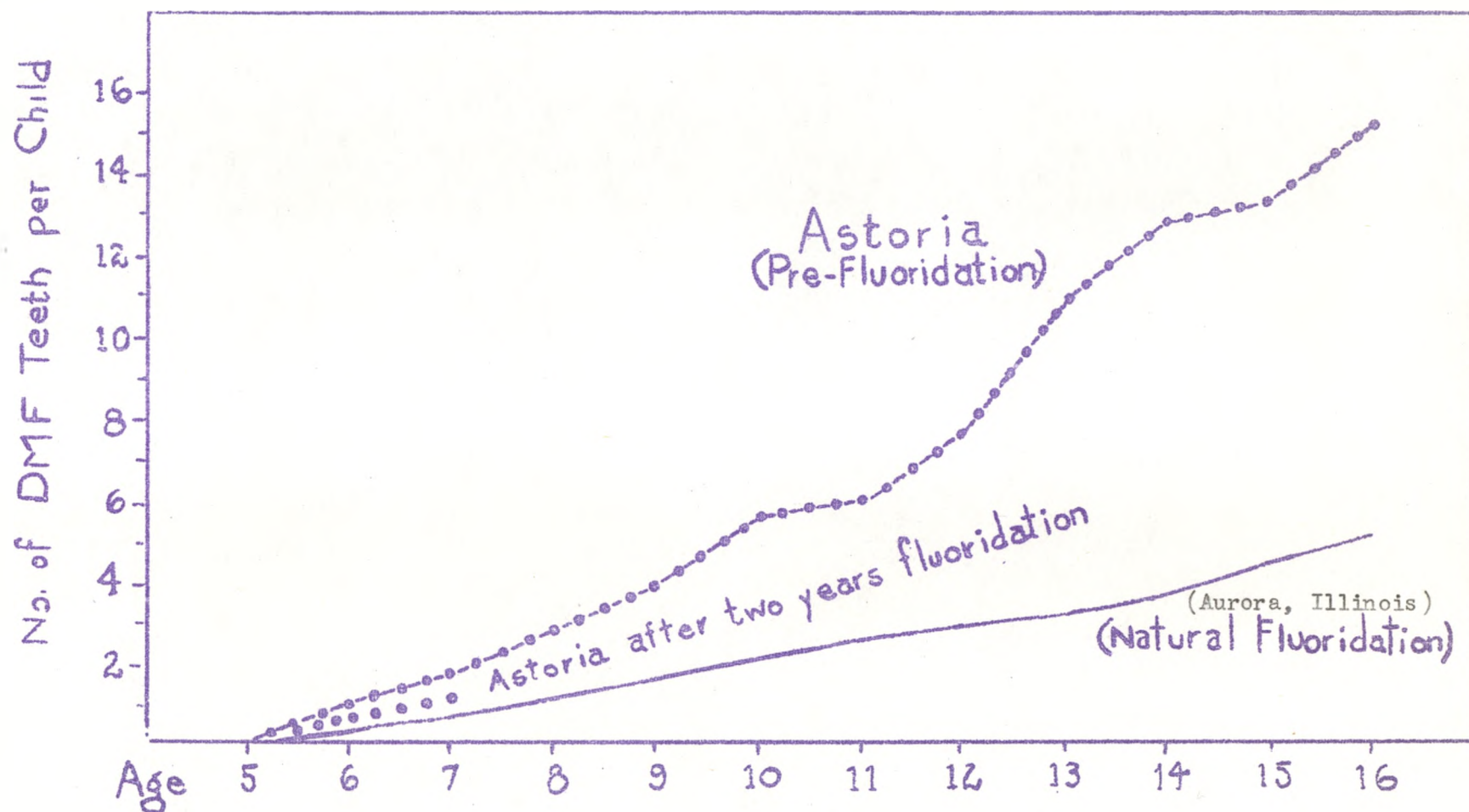


FIGURE 3



# Decayed, Missing & Filled Teeth\* Per Child Astoria, Oregon

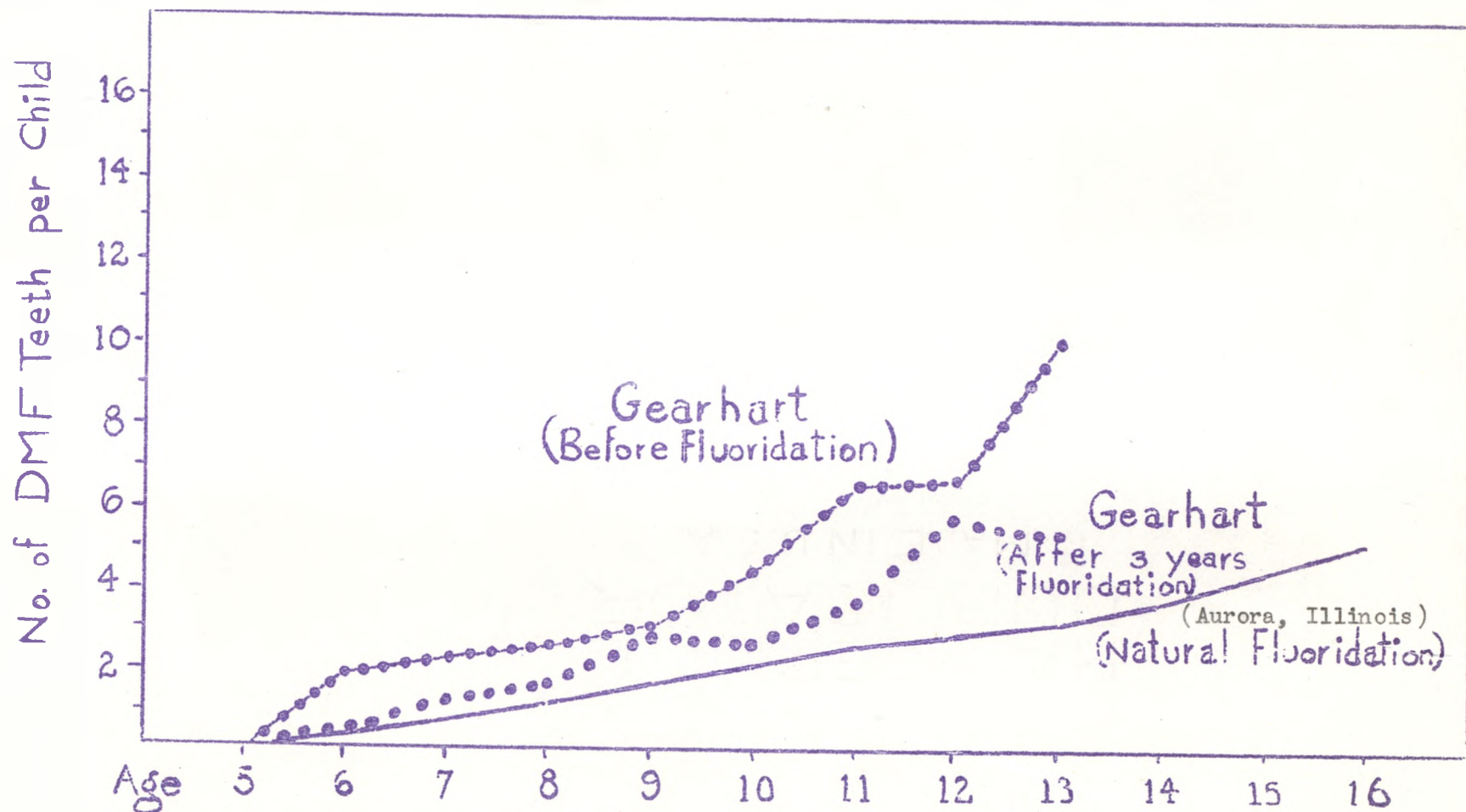


\* Permanent Teeth

FIGURE 4

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# Decayed, Missing & Filled Teeth\* Per Child Gearhart, Oregon - Before & After Fluoridation



\* Permanent Teeth

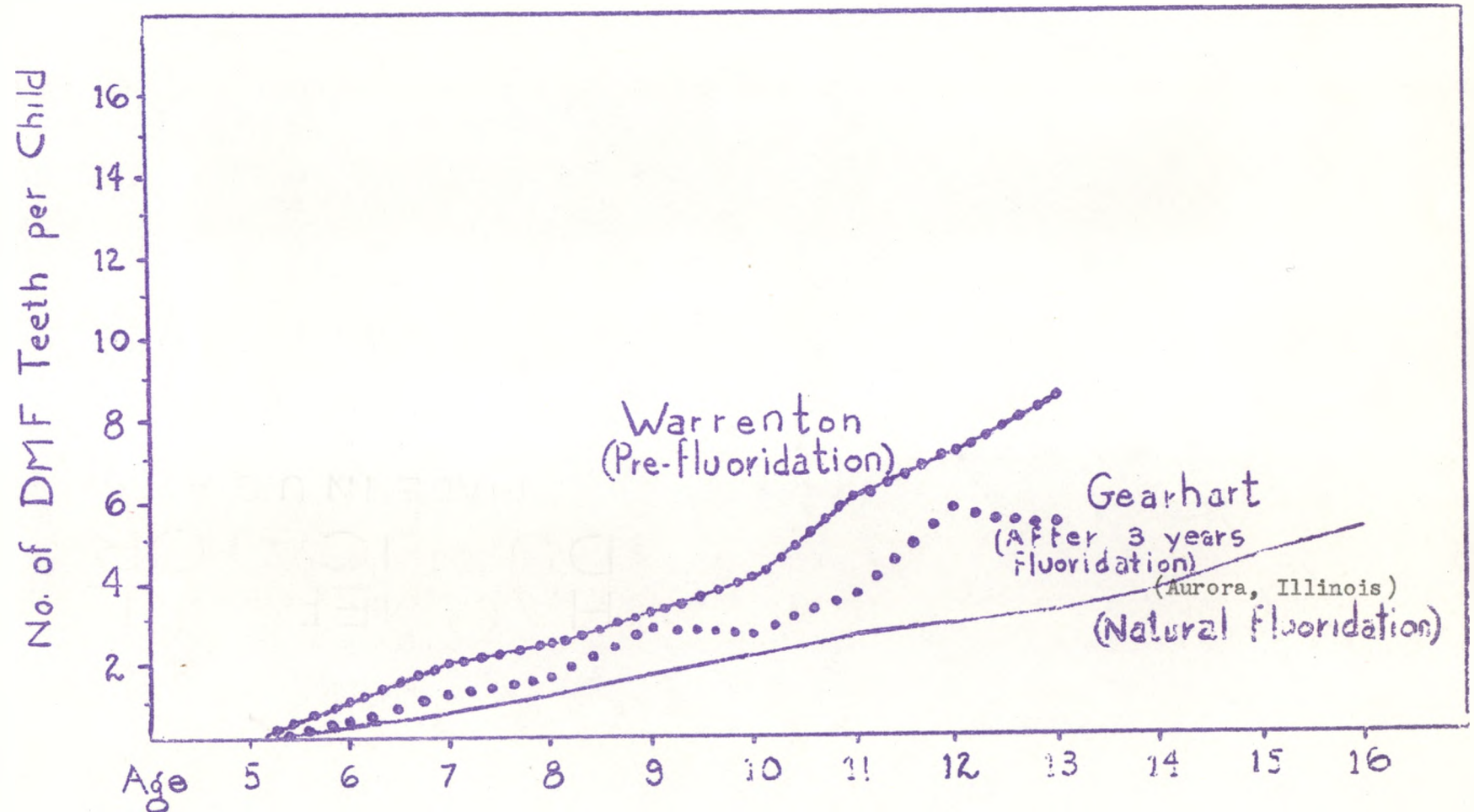
FIGURE 5

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# Decayed, Missing & Filled Teeth\* Per Child

## Comparison of Warrenton (not fluoridating) — Gearhart (after 3 years)

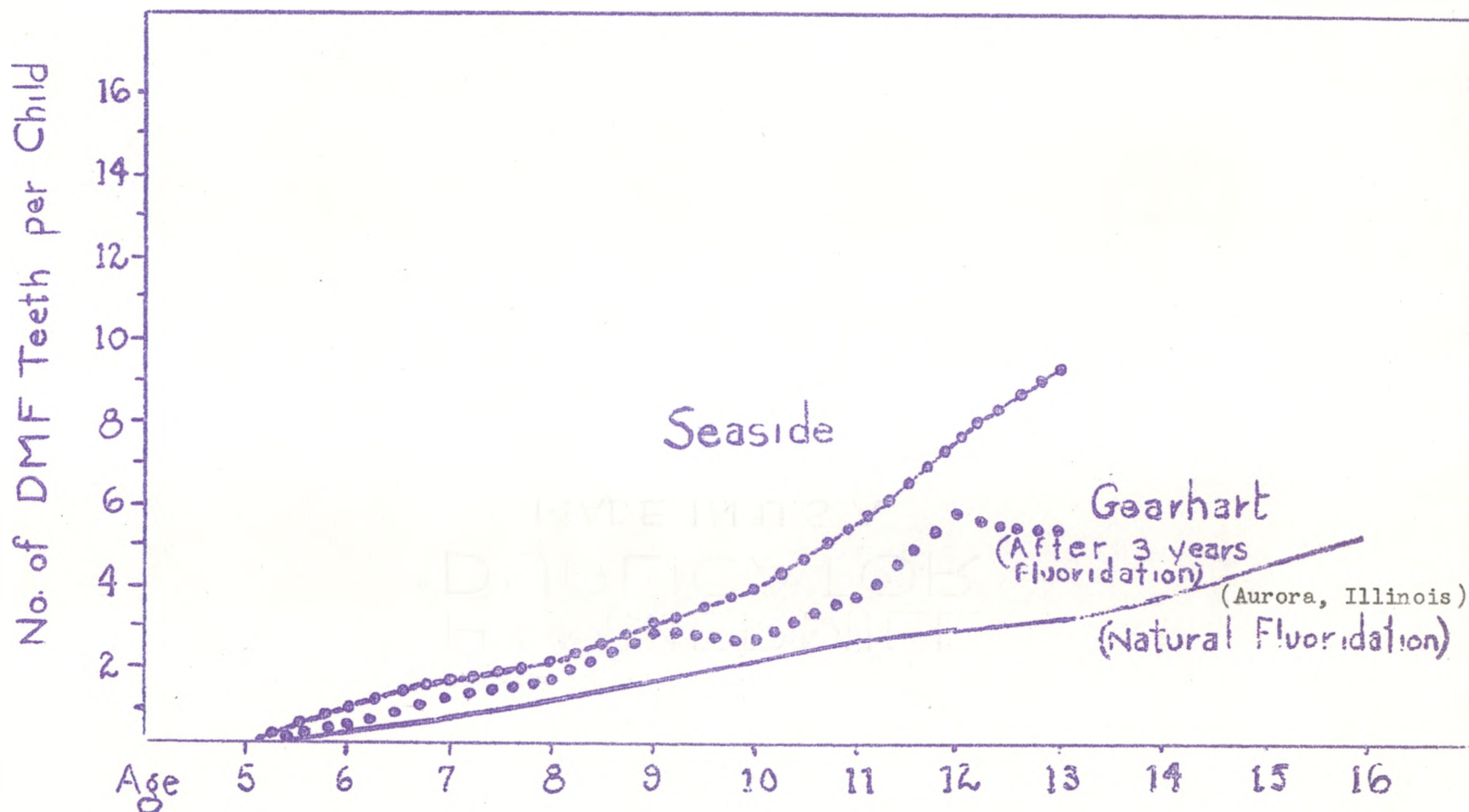


\* Permanent Teeth

FIGURE 6

# Decayed, Missing & Filled Teeth\* Per Child

## Comparison of Seaside (not fluoridating) — Gearhart (after 3 years)



\* Permanent Teeth

FIGURE 7

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